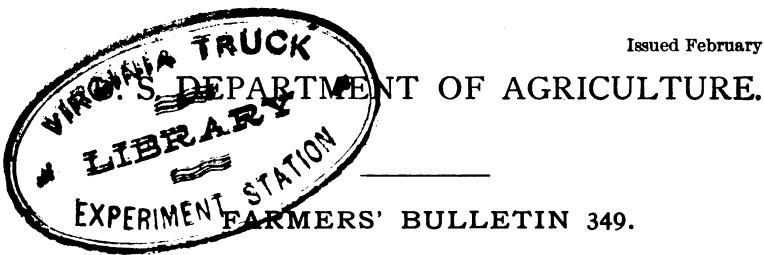


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THE DAIRY INDUSTRY IN THE SOUTH.

BY

B. H. RAWL, DUNCAN STUART, AND
GEORGE M. WHITAKER,

Dairy Division, Bureau of Animal Industry.



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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
Washington, D. C., December 9, 1908.

SIR: I respectfully transmit herewith a series of papers relating to "The Dairy Industry in the South," prepared by Messrs. B. H. Rawl, Duncan Stuart, and George M. Whitaker, of the Dairy Division of this Bureau.

In 1906 the Dairy Division began systematic field work in the Southern States for the development of the dairy industry in that section. This work has been carried on in cooperation with State experiment stations, agricultural colleges, and departments of agriculture, and has steadily increased until at present a representative of the Dairy Division is working in each of nine Southern States. The work has consisted largely of personal effort among the dairy farmers with a view to teaching them better methods, and has produced good results.

Fundamental to any question of production is the question of markets, and in order that the field workers might properly advise dairymen regarding the marketing of their products it was found necessary to make a systematic study of this subject. Consequently, during the fall of 1906 and the following winter, a representative of the division made a close inspection of the markets of 50 cities, the results of which are shown in the first paper. Prices were generally lower when this inspection was made than they were in 1907-8, but other conditions have not materially changed.

In the prosecution of this work it was realized that a decided improvement in the quality of the milk supply of the cities throughout the South was needed. Insanitary methods of producing and handling milk were a great menace to public health. In 1907 an inspector was assigned to investigate the situation more fully and give assistance in applying methods that would bring about improvement. The second paper discusses various phases of this question.

The report on markets shows that only a small part of the dairy products consumed in the South are produced in that section. A preliminary survey of the whole field was made in 1905 by Mr. Rawl, fol-

lowing which Congress made a special appropriation to prosecute this work on a more extended scale. This support by Congress has since been continued in the general appropriation for the Bureau of Animal Industry. The third paper describes the conditions which seem to be responsible for this small production of dairy products in the Southern States, and tells why dairying has remained an undeveloped industry in that section of the country.

These papers form a part of the Twenty-fourth Annual Report of the Bureau, but as they deal with a subject of great interest and importance to a large section of the country I respectfully recommend that they be made available for a wider distribution by reissuing them as a Farmers' Bulletin.

Respectfully,

A. D. MELVIN,

Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

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THE DAIRY INDUSTRY IN THE SOUTH.

SOUTHERN MARKETS FOR DAIRY PRODUCTS.

By DUNCAN STUART,

Assistant in Dairying, Dairy Division, Bureau of Animal Industry.

During several months in 1906-7, 50 of the larger cities in 13 States of the South were visited by the writer in order to obtain data relative to the dairy markets of that part of the country. Statistics were collected as to the amounts of butter, cheese, milk, condensed milk, and cream handled in these cities, and an attempt was made to determine what proportion of these amounts was brought in from the Northern and Western States. Table 6 shows how small a part of the butter and cheese consumed in this territory is produced by southern dairymen. In looking over these figures it must be borne in mind also that the prices obtained at that time (1906-7) were lower than at the present time (1908), hence the amounts that could be saved by home production of these articles would be even greater now.

During the past year, however, many new creameries have been established, particularly in Kentucky and Texas. The census of 1900 reported 7 creameries in Kentucky; the census of 1905 reported only 3; while in the spring of 1908 reports show that there are 42. These facts indicate that the dairy industry is advancing and is becoming of more importance in the States under consideration.

BUTTER.

Creamery Butter of the South.

The creamery butter production of the South is entirely inadequate to meet the demand, there being only a few regular creameries in the Southern States. It will be seen from Tables 1 and 4 that the quantity made is less than one-twentieth of that brought in. One creamery, at Fort Worth, Tex., uses cream from long distances in that State, and in addition gets a part of its supply from points in Oklahoma. Chattanooga, Tenn., also has creameries of this kind. The southern creameries are making a grade of butter which sells for a

price equal to that of the best northern and western product. Large amounts of print butter are shipped in by the butter companies of Illinois, Wisconsin, and Kansas; tub butter also is used extensively, the larger retail stores using the "cut-to-weight" butter cutters. Some butter is made in cities by the large milk plants, which turn their surplus milk and cream into butter. This fresh butter is put up in attractive prints and finds a ready sale among the milk customers.

Butter is shipped in refrigerator cars to the larger trade centers and from these points is reshipped to the smaller towns, usually without refrigeration. The great disadvantage of the butter business of the South is the lack of proper equipment for handling the commodity. The small retail stores often do not have proper cooling facilities, consequently the butter is soft and in many cases has become rancid before it is sold to the consumer.

It will be noted in Table 4 that about 23,435,000 pounds of creamery butter annually is brought in from Northern and Western States.

The census of 1900 reported the production of creamery and dairy butter in the South as follows:

TABLE 1.—*Production of creamery and farm butter in Southern States, census of 1900.*

State.	Butter made on farms.	Butter made in creameries.
Alabama.....	Pounds.	Pounds.
Arkansas.....	19,121,964	17,357
Florida.....	21,585,258	168,575
Georgia.....	1,386,445	
Kentucky.....	15,111,494	48,960
Louisiana.....	30,446,381	184,663
Mississippi.....	4,918,229	
North Carolina.....	18,881,236	48,525
South Carolina.....	16,913,802	
Tennessee.....	8,150,437	
Texas.....	29,091,696	207,823
Virginia.....	47,991,492	252,714
West Virginia.....	19,905,830	170,521
Total.....	16,913,129	41,000
	250,417,393	1,140,138

From the above figures it will be noted that of the total amount of butter produced in the South in 1899, only a very small part was made in creameries. It may be stated also that the relative proportion has not materially changed since.

Dairy and Country Butter.

The quality of the dairy butter varies greatly. Some of the better dairies are making a product almost, if not quite, equal to the best creamery butter. It is delivered to the consumers in pound

prints neatly wrapped in parchment paper and bearing the monogram or name of the dairy. Though this grade of butter is comparatively limited in quantity, it is now being supplied to the following cities by the near-by dairymen: Shreveport, La.; Raleigh, N. C.; Columbia, S. C.; Macon, Augusta, and Atlanta, Ga.; Tallahassee, Fla.; Montgomery and Birmingham, Ala.; Dallas, Austin, and San Antonio, Tex.

A large amount of dairy butter is shipped to the Carolinas and to Georgia from Tennessee in 5-pound and 10-pound tin pails. Some dairy butter made in Georgia has been shipped to market in South Carolina and sold there as Tennessee butter.

Of quite a different grade is the butter that is handled by the country merchant. This butter is brought to him in various shapes—in boxes, round prints, rolls, etc.—and in various shades of color. He retails what he can of it, and the balance he ships in tin cans or in barrels to the commission men in the large cities. By the time it reaches them it is apt to be very rancid, as a result of not having been properly washed when it was churned. One needs only to visit these commission merchants to see a product resembling axle grease more than butter. This quality of butter is bought as low as 7 cents a pound. The butter dealers of Austin, San Antonio, and Fort Worth, Tex., together ship annually about 300,000 pounds of this grade of butter to the renovating factories.

The butter produced in the South, even if it were all of the best quality, is of insufficient quantity to meet the demand; yet a large part of that which is produced has to be shipped to the renovating factories, as noted above, and treated by them before it is actually consumed. We see, therefore, that an advance must be made in the methods of manufacture, as well as in the amount turned out, before southern butter can meet the demands of consumers in that section.

Renovated Butter.

Quite a large amount of the butter consumed in the South is renovated or "process" butter. Reports gathered from 50 cities show an annual consumption of about 7,163,000 pounds, while the production of the renovating factories in that section of the country is only about 33,300 pounds.

Renovated butter is retailed at an average price of 26 cents a pound, much of it selling for 30 cents, and during the past winter (1907-8) it has sold as high as 35 cents a pound. Using the average price of 26 cents a pound, the annual value of the sales of this grade of butter amounts to about \$1,862,300 for 39 cities. Inasmuch as renovated butter can be bought at a lower price than creamery butter there is

a great temptation to sell it as creamery butter, and some dealers are undoubtedly doing this.

OLEOMARGARIN.

The Fifty-sixth Congress, second session, in Senate Report 2043, under date of January 26, 1901, published data furnished by the Treasury Department from its figures for the year 1899 showing the amount of oleomargarin shipped into the various States. At that time 11.5 per cent of the total amount consumed was used in the South.

Since the act of May 9, 1902, which imposed a tax of 10 cents a pound on the colored product and one-fourth of a cent on the uncolored, the consumption of oleomargarin has decreased. However, the consumption of this article is still great in some of the larger cities, especially in the winter season. Large amounts are handled in Norfolk, Richmond, Charlottesville, and Lynchburg, Va.; Chattanooga, Nashville, and Memphis, Tenn.; and Louisville, Lexington, Newport, and Covington, Ky. One of these cities uses as much as 700,000 pounds annually.

The colored product retails as high as 32 cents a pound, while the uncolored retails at an average of from 15 to 20 cents. Of the amount consumed in the South less than 8 per cent is manufactured in that section.

The scarcity of creamery butter in the winter season, and the unevenness of color and the tendency to rancidity which characterize the country butter, account for the large consumption of the better grades of oleomargarin.

The following table shows the amounts of oleomargarin used by States in 1899 (according to the census of 1900) and the approximate amounts used in the fiscal year 1905-6:

TABLE 2.—*Quantity of oleomargarin shipped into Southern States in 1899 and in fiscal year 1905-6.*

State.	1899.	Fiscal year 1905-6.	
		Pounds.	Pounds.
Alabama.	226,053	347,488	
Arkansas.	380,389	257,141	
Florida.	590,225	145,827	
Georgia.	495,004	172,494	
Kentucky.	1,490,577	1,286,402	
Louisiana.	1,043,502	345,847	
Mississippi.	104,622	61,289	
North Carolina.	110,244	125,605	
South Carolina.	258,159	72,843	
Tennessee.	714,640	475,867	
Texas.	1,518,264	570,088	
Virginia.	1,159,400	1,326,152	
West Virginia.	1,206,865	1,579,180	
Total.	9,297,944	6,766,223	

CHEESE.

Practically no whole-milk cheese, or cheese of the Cheddar type, is manufactured in the South. A few small factories are reported in South Carolina (two at Easley), Virginia, and West Virginia, but the output of these factories is very insignificant in comparison with the large amount consumed. In the 50 cities visited in 13 States the cheese handled amounted to approximately 42,000,000 pounds annually, while the production in the States mentioned, as indicated by the census figures, was probably less than 2 per cent of this total. The per capita consumption of cheese in the South is quite considerable, as large quantities are used by the laboring classes, who depend largely on crackers and cheese for their midday lunch.

Large amounts of imported and American-made cheese of foreign types are consumed in many of the cities. Large quantities of Roquefort, Camembert, Swiss, Brick, Gorgonzola, Parmesan, Limburg, and Roman cheese are used. Roman cheese is especially popular in New Orleans, while cheese imported from Sicily is used to a large extent in Tampa, Fla. The so-called cream cheese, made by putting clabbered milk into molds to drain, is used in great quantities as a breakfast dish in New Orleans. Texas cities handle large amounts of Brick cheese, but they also consume much of the imported varieties, especially during the cool weather.

The "daisy" type of Cheddar cheese is popular. Being a small cheese—20 to 23 pounds—it is easily handled during the hot season, and in addition is readily cut by the automatic cheese-cutting machines. "Flats" and "twins" are used to some extent in cool weather in the extreme Southern States, and to a larger degree in the Carolinas, Kentucky, and Tennessee.

Whole-milk cheese usually retails at 20 to 25 cents a pound, but in a few cities it is retailed as low as 17 cents a pound. Skim-milk cheese is being sold to some extent and is not always correctly branded. New York State cheese and Wisconsin cheese are the principal ones on the southern market.

The census of 1900 gives the following figures on the cheese production of the Southern States:

TABLE 3.—*Quantity of cheese produced in Southern States, census of 1900.*

State.	Cheese made on farms.	Cheese made in factories.
	Pounds.	Pounds.
Alabama.....	36,374	10,000
Arkansas.....	18,385	12,600
Florida.....	3,751	.....
Georgia.....	2,236	.....
Kentucky.....	45,759	28,000
Louisiana.....	135,104	.....
Mississippi.....	28,272	.....
North Carolina.....	28,883	.....
South Carolina.....	1,081	.....
Tennessee.....	26,622	6,201
Texas.....	136,133	58,290
Virginia.....	31,697	57,000
West Virginia.....	74,243	40,860
Total.....	568,540	212,951

From the above figures it will be seen that the cheese production of the South is wholly inadequate to the supply needed for consumption. The estimated amounts consumed in the larger cities of the above States, as shown in Table 4, totaled 41,582,545 pounds.

ICE CREAM.

There is a heavy ice cream consumption in southern cities. Much of the product, however, is of low grade, being made from whole milk and from bulk condensed milk. The price varies from 70 cents to \$3 a gallon, the latter price being paid for a fancy grade of cream put up in special forms. The average retail price is about \$1.50 a gallon.

The following are some of the cities manufacturing large amounts of ice cream: Memphis, Chattanooga, and Nashville, Tenn.; Little Rock, Ark.; Fort Worth, San Antonio, and Dallas, Tex.; Louisville, Ky.; Jackson, Miss.; Birmingham, Ala.; and Macon and Atlanta, Ga. Memphis ships the largest amount, one of its manufacturers making as high as 3,000 gallons in one day in the summer season. Ice cream manufactured in Tennessee and Georgia is shipped to points as far south as Florida.

CREAM.

In the South the consumption of cream is small. This is due to the scarcity of fresh cream rather than to a lack of demand for this dairy product. The cream sold is also quite variable in quality, some of it being only equal to a rich milk. Much unsweetened condensed milk is used in the place of cream. The fresh cream in some cities is supplied by near-by dairymen, while others get it from long distances. The larger cities of Georgia, with the exception of Savannah, are fairly well supplied with cream. Newport and Covington, Ky., get a part of their supply from Cincinnati dealers, while Louisville gets cream by rail from Illinois and Indiana. The North Carolina cities depend largely on local product; however, a small amount is shipped in from Virginia. Tennessee cities, with the exception of Memphis, are well supplied with local product. Texas cities, excepting Fort Worth, are also supplied from within the State.

Mobile, Ala., gets a part of its supply from Tennessee; all the larger cities of Florida, with the exception of Tallahassee, get a large part of their cream from points in Georgia and Tennessee; a portion of the supply for New Orleans comes from Tennessee and Illinois; Jackson, Miss., gets a small supply from Tennessee; Memphis gets a part of its supply from Mississippi and Arkansas; and Norfolk, Portsmouth, and Richmond, Va., receive fresh cream from New York City; Wilmington, N. C., Jacksonville and St. Augustine, Fla., and Galveston, Tex., depend largely on unsweetened condensed milk.

CONDENSED MILK.

Condensed milk is consumed in large quantities in southern cities and to some extent on the farms. It is put up in small cans selling for 5 and 10 cents each, but is also sold in larger sizes. The smaller sizes are very convenient for family use during the hot season. In many sections the supply of fresh milk is unsuitable for infant feeding and the physician invariably recommends condensed milk.

Fresh cream being scarce, condensed milk is used as a substitute. This is used as cream and is also manufactured into ice cream. Unsweetened condensed milk is received in 10-gallon cans at Jacksonville from New York City. Memphis gets bulk condensed milk from Arkansas. St. Augustine and Galveston also use large amounts of the unsweetened product.

QUANTITIES AND PRICES OF DAIRY PRODUCTS.

The following tables give data regarding the dairy markets of the 50 cities, in 13 States of the South, discussed in the preceding pages:

TABLE 4.—*Quantity of dairy products handled in 50 southern cities, fiscal year 1905-6.*

City.	Approximate quantity handled of—					Milk sold daily.	
	Creamery butter.	Renovated butter.	Oleomargarin. ^a	Cheese.	Condensed milk.	Quantity.	Amount bottled.
Arkansas:							
Fort Smith.....	126,000	15,000	26,100	572,000	291,360	200	.....
Little Rock.....	500,000	100,000	51,000	800,000	499,200	3,300	10
Alabama:							
Birmingham.....	291,205	278,000	136,000	1,767,520	1,453,680	1,735	33
Mobile.....	882,400	118,000	49,300	916,000	1,227,600	1,100	.....
Montgomery.....	153,708	124,540	76,000	1,203,000	425,040	600	.....
Florida:							
Jacksonville.....	1,500,000	200,000	150,000	1,675,650	2,803,200	1,250	50
Pensacola.....	449,340	28,541	17,800	297,120	610,800	450	.....
St. Augustine.....	.....	(b)	2,000	.....	.....	400	.....
Tallahassee.....	9,000	.....	.....	41,760	27,360	150	.....
Tampa.....	742,070	91,600	18,550	400,830	2,683,680	1,500	75
Georgia:							
Atlanta.....	630,000	20,000	61,000	2,117,500	1,126,320	5,000	.....
Augusta.....	380,100	(?)	8,440	1,289,500	.....	1,200	.....
Macon.....	97,740	98,000	12,900	1,395,950	362,592	800	.....
Savannah.....	96,900	229,263	52,730	946,307	1,536,000	.....	.....
Valdosta.....	102,750	34,000	600	185,000	122,208	200	.....
Kentucky:							
Covington.....	190,000	60,000	92,900	250,000	.....	2,500	33
Lexington.....	50,000	.....	162,440	270,000	48,000	2,500	50
Louisville.....	2,000,000	500,000	699,000	2,000,000	888,000	10,000	60
Newport.....	150,000	50,000	69,000	150,000	.....	1,750	.....
Louisiana:							
Baton Rouge.....	43,500	26,300	19,200	98,000	416,640	.....	.....
New Orleans.....	4,700,000	800,000	187,463	2,069,976	12,480,000	16,000	.....
Shreveport.....	60,700	28,000	37,840	612,000	708,000	1,100	.....
Mississippi:							
Jackson.....	58,000	24,000	6,900	192,000	157,440	510	.....
Meridian.....	15,000	23,150	6,300	627,530	192,000	300	.....
Natchez.....	82,588	14,226	3,900	255,245	601,200	375	.....
Vicksburg.....	156,884	122,763	8,600	389,560	614,400	580	.....
North Carolina:							
Asheville.....	20,000	.....	14,400	120,000	40,320	800	.....
Charlotte.....	14,600	.....	1,350	543,000	(?)	675	25
Greensboro.....	18,390	.....	10,700	267,600	(?)	.....	.....
Raleigh.....	26,676	2,000	19,750	203,750	(?)	250	.....
Wilmington.....	421,700	59,000	8,400	547,000	(?)	40	.....
South Carolina:							
Charleston.....	900,000	600,000	25,214	1,063,415	1,341,600	.....	.....
Columbia.....	218,540	50,000	27,300	253,680	357,696	400	.....
Tennessee:							
Chattanooga.....	425,040	88,380	74,000	773,742	1,992,000	2,200	50
Knoxville.....	50,000	5,000	46,700	400,000	105,600	2,000	25
Memphis.....	1,314,420	416,100	107,300	4,000,000	1,805,760	8,750	75
Nashville.....	248,100	.....	98,000	1,146,200	168,000	.....	.....
Texas:							
Austin.....	1,000	.....	25,000	530,000	144,000	.....	.....
Dallas.....	350,000	10,000	79,490	750,000	768,480	2,000	.....
Fort Worth.....	531,250	186,730	53,500	650,000	566,400	1,600	.....
Houston.....	908,460	515,608	59,700	1,037,540	2,231,136	.....	.....
Galveston.....	878,000	164,500	50,000	791,300	960,000	1,120	.....
San Antonio.....	116,660	.....	54,000	682,870	703,200	4,000	.....
Waco.....	27,500	.....	16,000	450,000	315,216	33	.....
West Virginia:							
Charleston.....	286,720	125,000	25,214	430,000	480,000	600	.....
Virginia:							
Charlottesville.....	20,000	5,000	20,050	75,000	33,600	.....	.....
Lynchburg.....	40,000	.....	87,220	245,000	72,960	800	.....
Norfolk.....	2,250,000	1,500,000	113,414	4,000,000	(?)	2,000	.....
Portsmouth.....	150,000	150,000	12,700	100,000	(?)	600	.....
Richmond.....	750,000	300,000	376,118	2,000,000	1,200,000	5,000	.....
Total.....	23,434,941	7,162,701	3,361,483	41,582,545	42,560,688	.....	.....

^a Consumed.^b St. Augustine included in Jacksonville report.

TABLE 5.—*Wholesale and retail prices of dairy products handled in 50 southern cities, fiscal year 1905-6.*

City.	Milk.			Cream.			Butter.		
	Paid to producer, per gallon.	Retail, per quart.	Retail, per quart.	Paid to producer, per gallon.	Retail, per quart.	Fat.	Cream- ery, per pound.	Dairy or country, per pound.	Reno- vated, per pound.
Arkansas:									
Fort Smith.....	Cents. 11 $\frac{1}{4}$ -15	Cents. 25	Cents. 7-8 $\frac{1}{2}$	\$1.00	Cents. 35	Per ct. 30	Cents. 35	Cents. 25	Cents. 20-25
Little Rock.....	12 $\frac{1}{2}$ -15	20-25	6 $\frac{1}{2}$ -8 $\frac{1}{2}$	\$0.80-1.00	{ 40	{ 20 30	{ 30-35	{ 25	{ 25
Alabama:									
Birmingham.....	15-20	20-25	8 $\frac{1}{2}$ -10	.80-1.00	40	30	30-35	25-35	25-30
Mobile.....		25-30	8 $\frac{1}{2}$ -10	{ 2.00		{ 20	{ 30-35		25-30
Montgomery.....		18-20	6 $\frac{1}{2}$ -8	{ 1.25					25-30
Florida:									
Jacksonville.....		25-30	8-10		40		33-35		28-30
Pensacola.....		35	10		40				
St. Augustine.....		32	10	1.20	40	30	35-40		25
Tallahassee.....			8 $\frac{1}{2}$ -10		40		35	25-30	
Tampa.....		25-27	35	9-10	1.00	20	35	35-40	30
Georgia:									
Atlanta.....		20-25	30	8 $\frac{1}{2}$ -10		30-40		30-35	25-40
Augusta.....			25	10	1.00	40	25	32-35	30
Macon.....				8 $\frac{1}{2}$	1.00	40	25	33	25-30
Savannah.....			25-30	8 $\frac{1}{2}$ -10	2.00	50-60		35	25-30
Valdosta.....			30	10		25		35-40	25-35
Kentucky:									
Covington.....				6-8	.80	24-30		25-30	
Lexington.....				6-8	.60	30	20	30-40	25-30
Louisville.....		11-15		7 $\frac{1}{2}$ -10	.60	{ 30 25	{ 20	{ 30-35	12-30
Newport.....		18-20	25	7-8	.70	24-30		30-35	25-30
Louisiana:									
Baton Rouge.....		25	10		40			30-35	
New Orleans.....		14-16	20-25	7 $\frac{1}{2}$ -10	.80	30-40	20	32-35	30
Shreveport.....			30	7 $\frac{1}{2}$ -10		50	25	35-40	25-30
Mississippi:									
Jackson.....		25		7 $\frac{1}{2}$ -10	.75	25		30-35	15-30
Meridian.....				10	1.00			35-37 $\frac{1}{2}$	15-30
Natchez.....		25		8-10	1.00	40		37 $\frac{1}{2}$	25-30
Vicksburg.....		24-32		8-10	.90-1.20			28-35	18-25
North Carolina:									
Asheville.....		20-25	7-10	{ 1.00		{ 18-20 30	{ 30-35	25-30	
Charlotte.....		15	25	10	1.20	40		35-40	7-35
Greensboro.....		17-20	6-10	.90-1.25	25-40		30-35	12-30	25
Raleigh.....		25	8 $\frac{1}{2}$ -10	1.00	50	25-30	30-35	25-35	
Wilmington.....			10-12	2.00	50-60		30-40	25-30	25-30
South Carolina:									
Charleston.....		20-24		8-10		60	30	30-35	25
Columbia.....		24	7-10			50		28-35	10-30
Tennessee:									
Chattanooga.....		13-17	25	7-8 $\frac{1}{2}$	.80-1.00	35	20	35	20-25
Knoxville.....		20-25		7-8		32	20-22	30-35	25-30
Memphis.....		14-17		7-10		25	20	35	25
Nashville.....		13-18		5-8	1.00	25-30	12 $\frac{1}{2}$ -30	30	28
Texas:									
Austin.....		20-25		5-7 $\frac{1}{2}$	1.00			30-35	10-30
Dallas.....		20-25		8 $\frac{1}{2}$	1.00-2.00	40	35	30-35	25-35
Fort Worth.....		20	7		1.00	30	25	27-30	8-30
Houston.....		20-25	7 $\frac{1}{2}$ -10		.75-1.20			30-35	20-30
Galveston.....			6-10		.75-1.00			35	25-30
San Antonio.....		15-18	25	7-8	.75	30-40	25	25-35	10-30
Waco.....				5-7 $\frac{1}{2}$	1.00	25		30-35	10-30
West Virginia:									
Charleston.....			25	8-10		30		30-40	25-30
Virginia:									
Charlottesville.....			24	6-8	1.00	30	15	30-35	20-25
Lynchburg.....				10		25		33	20-25
Norfolk.....				10		40		30-35	30
Portsmouth.....			25	8-10	.80-1.00	40			
Richmond.....		15-19	24-28	7-10	.85-1.00	40	25	35	15-35

TABLE 5.—*Wholesale and retail prices of dairy products handled in 50 southern cities, fiscal year 1905-6—Continued.*

City.	Oleo-margarin, per pound.	Cheese.		Ice cream.		Buttermilk, per gallon.	Skim milk, per gallon.
		Retail, per pound.	Whole-sale, per pound.	Retail, per gallon.	Whole-sale, per gallon.		
Arkansas:							
Fort Smith.....	Cents. 15-25	Cents. 20-25	17	\$1.00	\$0.70	10-12	10-12
Little Rock.....	15-25			\$1.00-1.50	.65-.85	12 $\frac{1}{2}$ -15	10
Alabama:							
Birmingham.....	15-25	20	16	1.50	.70-.90	10-15	10-12 $\frac{1}{2}$
Mobile.....	15-25	18-20		1.25-2.00	1.00	10-12 $\frac{1}{2}$	10-12 $\frac{1}{2}$
Montgomery.....	15-25	19-20	14-15	1.00-1.25		10-15	10-15
Florida:							
Jacksonville.....	20-25	20		1.50			
Pensacola.....				2.00			
St. Augustine.....	15-25	20	15	1.20			
Tallahassee.....		20	15	1.50		10	10
Tampa.....		20		1.50	1.00	20	20
Georgia:							
Atlanta.....		20		1.50-3.00		15	12 $\frac{1}{2}$
Augusta.....		17 $\frac{1}{2}$ -20		1.50		12-15	
Macon.....	20	20	14 $\frac{1}{2}$	1.25-2.00	.80-1.15	10-15	No sale.
Savannah.....		20	15				
Valdosta.....		20	15	1.60	1.20	15	
Kentucky:							
Covington.....						10	10-12
Lexington.....	15-25	20	15-16	1.00	.75-.85	10	10
Louisville.....	12 $\frac{1}{2}$ -25	18-20	16			15	15
Newport.....	15-22 $\frac{1}{2}$			1.50	1.00	10	10-12
Louisiana:							
Baton Rouge.....	15		15	1.50	1.00	20	15
New Orleans.....	15-25	20-25	15	1.50-2.00	.75-1.00	10-12	
Shreveport.....		20-25	14-17 $\frac{1}{2}$	1.25-2.00		15	
Mississippi:							
Jackson.....	20-25	20	16	1.25-2.00	1.00		
Meridian.....		20-22 $\frac{1}{2}$	15-16	1.50-2.00			
Natchez.....		20	16 $\frac{1}{2}$	1.25-2.00			
Vicksburg.....	15	20					
North Carolina:							
Asheville.....		20			.80-1.25	10	10
Charlotte.....	15-20	17 $\frac{1}{2}$ -20		1.30-1.50	1.00	10	15
Greensboro.....		20		1.00		10	10
Raleigh.....	15-20	17 $\frac{1}{2}$ -20		1.00-2.00		15	
Wilmington.....		20	15	1.50	1.00	20	20
South Carolina:							
Charleston.....	15-25	20-22		1.40			
Columbia.....		20	16	1.50		10	
Tennessee:							
Chattanooga.....	25	20	15-16	1.25-1.50	.75-.90	10-15	4-10
Knoxville.....	20	20	14-15	1.00-1.25	.75-1.00	10	5-10
Memphis.....	20-25	20	14-15	1.25	.70-1.00	10	10
Nashville.....	25	20	15	1.00-1.50	.75-.90		
Texas:							
Austin.....		20	15-16			10-15	10
Dallas.....		20	15	1.00-2.00	.75-1.00	10-12 $\frac{1}{2}$	
Fort Worth.....	12 $\frac{1}{2}$ -25	20	16	1.00-1.50	.75-1.00	10	12 $\frac{1}{2}$
Houston.....	15-20	17 $\frac{1}{2}$ -20		1.00-2.00		15-20	5-6
Galveston.....		18-25		1.25	.75-1.00	15-20	12 $\frac{1}{2}$
San Antonio.....		20		1.00-1.50	.70-.80	12-15	10
Waco.....				1.00	.50-.70	10	5
West Virginia:							
Charleston.....	15-25	15-20		1.25		15	
Virginia:							
Charlottesville.....	12 $\frac{1}{2}$ -20	20	15	1.00-1.25	1.00	10	10
Lynchburg.....	15	20	14-15	1.50	1.00	15-16	
Norfolk.....	15-32	18	14	1.50-2.00	.65-1.00	20	
Portsmouth.....				1.00-1.50			
Richmond.....	15-25			1.50	1.00	14	

THE MILK SUPPLY OF SOUTHERN CITIES.

By GEORGE M. WHITAKER,
Inspector, Dairy Division, Bureau of Animal Industry.

PRODUCTION.

Most of the milk supply of southern cities is produced within a few miles of the place of consumption. Many herds are kept within the thickly settled portions of the cities, where land is expensive. This generally means overcrowded stables, poorly lighted and ventilated, with contracted yards for exercise, filthy at all times, and almost knee-

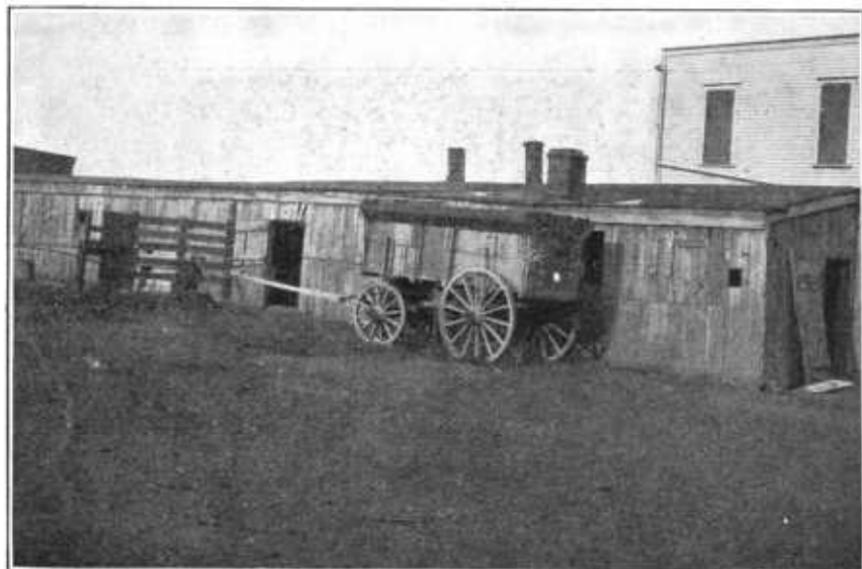


FIG. 1.—Cow stable in southern city, showing poor lighting and ventilation.

deep with mud after a rain. The feed used in these dairies is largely such as does not call for much storage space and is influenced to some extent by local conditions of production. Many city herds are fed nothing but cotton-seed meal and hulls. In some instances wheat bran is added. In cities where distilleries are located distillery slop is fed, though the trend of city ordinances is in opposition to this. Where there are breweries, brewer's grains are prominent in the dairy ration. Sometimes the grains are reduced to a thin slop with warm water. On account of the readiness with which the grains ferment some health boards prohibit the use of wet grains.

As the dairies are farther removed from the thickly settled portions of the cities to locations where land is less valuable the cows get more

green feed in season, according to conditions. In some places a small bunch of green fodder of some kind is fed in the manger; in others the cows are allowed an hour's run each morning in a field of growing wheat. At still greater distances increasing amounts of green fodder are fed, though soiling as a system has made but little progress; and where the land is within an easy drive of the city and cheap enough there is some pasturage.

CARE OF MILK AT DAIRY.

Generally speaking, milk is not properly cooled by producers. The use of ice is unknown among the ordinary dairies. Some producers run the milk over a cooler supplied with spring water of a temperature rarely below 65° F. and frequently as high as 75°. Others set



FIG. 2.—Insanitary location of milk cooler in barn.

the cans of milk in tanks of spring water or in the running spring water. Other dairymen make no pretense of cooling the milk and can or bottle it for market at the natural animal temperature. The cooler, when used, sometimes stands in the stable (fig. 2), and frequently the milk is strained into the shipping cans behind the cows. Bottling is often done in rooms connected with the stable or in places where cleanliness is impossible (fig. 3).

Because the climate is generally mild and at times very warm much work is done out of doors. This frequently results in insanitary ways of handling milk utensils and the milk itself. For instance, when water for cleansing utensils and bottles is heated in an old pail set up out of doors on a few loose bricks the presumption against proper sterilization of milk receptacles at that dairy is strong. Many dairies were found where the "milk room" was an open porch of the

dairyman's residence (fig. 4), sometimes very disorderly and sometimes also the place where most of the domestic kitchen work is done, and in one case where hens were sitting. Milk receptacles will hardly be cleansed in a sanitary manner under such conditions, to say nothing of the exposure of the milk to impure air in straining and bottling.

DISTRIBUTION.

Most of the milk supply is retailed and distributed by the producers. Very little milk is transported by railroad in the South, and comparatively few cities have milk plants or depots owned by middlemen. Such establishments are found, however, in Macon, Atlanta,



FIG. 3.—Milk room made by partitioning off with wire netting a corner of wagon house.

and Savannah, Ga.; Asheville, N. C.; Richmond, Va.; New Orleans, La.; Knoxville and Memphis, Tenn.; San Antonio, Fort Worth, and Austin, Tex.; and Fort Smith and Little Rock, Ark. Nearly all of the establishments in these cities pasteurize their entire output. Most of the milk is bought by the gallon, but some buy on a butterfat basis. In Savannah and Memphis the establishment of the plants grew largely out of a movement on the part of the producers to relieve themselves of the expense and trouble incident to doing a retail business. On account of climatic conditions two deliveries a day are frequent, milk often reaching the consumer less than five hours old. Bottles are used to a limited extent. (See Table 4.) The custom of dipping milk from the open can prevails somewhat, and in many

instances milk is drawn through faucets from large carriers. In a few cases the milk is poured from a two-gallon can provided with a cover which is also a measure, and in a few cities it is delivered in a varied assortment of tin cans and earthen jugs. Milk is usually delivered from wagons built especially for the business. In New Orleans high two-wheeled carts are used, the carrier faucet-cans being placed in the front part.

QUALITY.

The quality of the market milk is generally satisfactory so far as amount of milk solids is concerned. In many instances it is much above the legal requirement. The Memphis city chemist says that

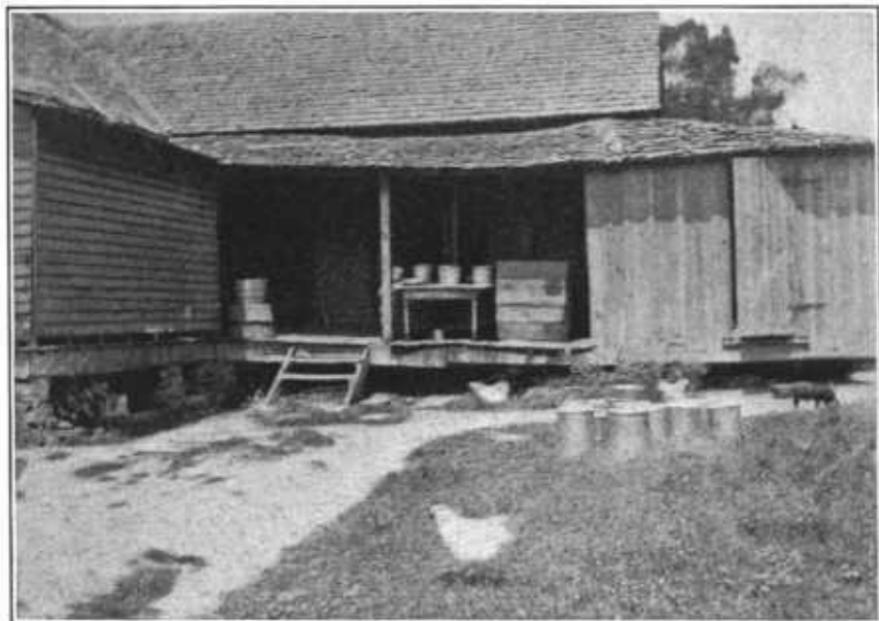


FIG. 4.—Porch of residence used as milk room; utensils drying and airing on lawn amid chickens and pigs.

the milk supply of that city will average from 4.5 to 5 per cent of fat. Jersey blood is prominent among the dairy herds.

As regards cleanliness and freedom from bacterial contamination the South has its share of the ignorance and negligence to which is due so much unsatisfactory market milk. In addition to this, some climatic and economic conditions have a peculiarly unfavorable bearing. Many producers are renters, doing a small business and struggling hard to make a living. Frequently they have poor barns and milk houses as well as inadequate facilities for handling the milk and washing the utensils. (See figs. 5 and 6.) In many cases the wife

and children have to lend a hand in the dairy work. All these conditions are not only bad in themselves, but they have a tendency to crush any ambition to improve. The scarcity of ice prevents the proper cooling of much milk. Considerable quantities are therefore handled and sold at a high temperature, promoting rapid increase of bacteria.

A certified milk commission exists in Louisville, Ky.

PRICE, SUPPLY, AND DEMAND.

In many cities 10 cents a quart is the prevailing retail price of milk to the consumer. In some places only a few of the better dairies get



FIG. 5.—Residence of small dairyman containing milk room; milk cans exposed to chickens.

10 cents a quart, while many of the others take any price that is offered—as low as 5 cents a quart in a few instances. A common price is $6\frac{1}{4}$ cents a quart, 4 quarts for 25 cents.

Generally speaking there is no oversupply, and in many places milk is actually scarce at times. In spite of this complaints are made of the competition in the business, chiefly among dairymen whose conditions are ordinary to poor. Prices are frequently cut where the ticket system prevails by giving a few extra tickets for a dollar. Twenty-eight pint tickets for \$1 is a common price, which is about 7.2 cents per quart; but in some instances the thrifty housekeeper by skillful

bargaining can get 30 or even 32 tickets, the dealer insisting that his price remains at 28 tickets and that the extra ones are a gift. Complaint is made in some places, notably Memphis, of uneven production, and of competition from small summer dairies in which the cows are milked for only such time as they can be kept on pasture. This "grass milk," cheaply produced, is sold at almost any price, and depresses the market for a few weeks each year, leaving some of the regular all-the-year dairies with a temporary surplus.

In some places there is a shortage, which compels the use of much condensed milk. Some of the large hotels are compelled to keep a



FIG. 6.—Milk house with one side open; work done by children.

stock of condensed milk on hand to be sure of an ample supply. In Florida complaints came to the writer from consumers concerning the inadequacy of the supply and the resultant independence of the milk producers and dealers. One Jacksonville business man with a "bottle baby" had milk delivered in the morning by one milkman and in the evening by another—double what he needed—to insure a supply should one or the other happen to omit his regular call.

INSPECTION.

Many cities have milk ordinances, though in not a few cases very little is done to enforce them. In some cities the collection of license fees and the issuance of permits for the sale of milk is the extent of milk inspection. Many cities had no inspection of any kind until a short time ago.

During the past year a campaign for better milk was taken up in Texas by a leading magazine. Representatives of the publication were sent to the seven largest cities of the State, and samples were taken of the milk as delivered by the dairymen. Thirty-five out of 53 samples, or 66 per cent, were found to contain preservatives. Some



FIG. 7.—Uniformed milk-inspection corps, Atlanta, Ga.

of the samples were also low in butterfat, indicating the addition of water or partial skimming. Within a few weeks after the publication of the magazine article showing these facts the municipal authorities in several of the cities began a warfare against adulterated milk.

Where ordinances have been in existence and have been enforced, the work under them has related largely to securing evidence of the sale of adulterated or under-standard milk, and in some places excellent work has been done along these lines, greatly improving the composition of the city supply. But in at least one city, where the custom of drawing milk from large cans prevails, samples are taken only

from those carriers, and no effort is made to sample milk as delivered to the consumer, though it is a matter of common knowledge that this manner of distribution results in a very uneven product, many customers getting only skim milk.

The sanitary side of dairy inspection has received too little attention, but a gradual improvement in this direction is noticed. In Charleston, S. C., a code of laws was recently adopted and a milk inspector appointed. Considerable attention is given to the sanitary inspection of stables and methods of handling milk, with encouraging results. In Savannah, Ga., an outbreak of typhoid fever, traceable to a leading dairy, has called attention to the importance of supervising the milk supply, and an agitation for more inspection is under way. In Asheville, N. C., a milk inspector was recently appointed, and already there has been a radical cleaning up of some of the worst stables and an improvement in others. In Nashville and Memphis, Tenn., the county health officers have taken a new interest in the sanitary inspection of the dairies under their jurisdiction. Columbia, S. C., is agitating for milk ordinances and inspection. The Galveston, Tex., health office now gives a special certificate to all dairies whose apparatus, dairy rooms, and herds come up to a certain standard of cleanliness. Atlanta, Ga., has uniformed milk inspectors, who are furnished with buggies. (See fig. 7.) This city has recently adopted radical ordinances and greatly improved its milk supply. These ordinances, among other things, provide that—

All milk shall be strained as soon as milked.

All milk must be offered for sale as milked from the cows, and shall not be passed through cream separators or other apparatus other than strainers for the purpose of removing manure, dirt, or other substance.

All milk shall be marketed as soon as possible after milking.

It shall be unlawful for any person to bring or receive into the city of Atlanta, for sale, or to sell any milk which contains any manure or dirt (that is, in quantity sufficient to be detected with the naked eye after milk has been standing for one hour or more).

In Louisville, Ky., the activity of the State food inspection officials has succeeded in prohibiting the sale of milk from swill-fed dairies in that city. This war against milk from cows fed on distillery slops has had a good effect upon the milk supplies of the other cities of that State.

COST OF PRODUCTION.

Several factors tend to increase the cost of producing milk in the South. In the first place, but little attention seems to be given to keeping dairy cows which produce large amounts of milk, consequently few cows are kept which are large producers. In some instances Jersey blood predominates, but of families which are small

producers. Many herds were found giving only about 5 quarts per day per animal. In other cases cows of the beef type are bought at the stock yards when about to freshen; these are milked through one period of lactation, then fattened, and sold for beef. Rarely does one find a herd of cows of dairy type selected or bred for the largest possible production of milk with 3.5 to 4 per cent fat.

Secondly, considerable work is done in an uneconomical manner. On account of the warm climate two deliveries per day are frequent, which means doubling this item of expense. The double time of man and team, and wear and tear of horse and wagon, must frequently more than offset the saving of ice, to say nothing of the inferior



FIG. 8.—Stable affording inadequate protection to cows during inclement weather.

quality of the product. When milk is cooled in a spring the spring house is often at a distance from barn and residence, necessitating many additional steps and increasing the cost of production. The saving of steps seems to be an idea impossible for many persons to grasp.

Thirdly, many southern dairy barns are unsuited for the most profitable production of milk on account of the fact that cows can not be kept comfortable in them at all times. In a country where much of the winter weather is mild the dairyman is apt to overlook the fact that even a brief chill to the delicate organism of a sensitive

dairy cow damages the animal and shrinks the milk flow, which may be very expensive; the full flow of milk may not be regained for months. Consequently, where the temperature may drop as low as 40° F. even for only a few days in the year, or where damp chilly winds may bring discomfort to unprotected cows, even though for only a few hours, the stables should be so constructed as to protect the animals from the full force of the elements; otherwise the production is liable to drop in amount at almost any time. (See figs. 8 and 9.) Figure 10 illustrates a good type of southern barn which affords



FIG. 9.—Interior of stable which does not protect cows against bad weather.

protection against inclement weather and at the same time provides light and ventilation.

BUTTERMILK.

Large quantities of buttermilk are consumed in southern cities—Birmingham, Ala., being notable in this respect. It is everywhere popular as a beverage, and is always on the menus of hotels and restaurants; it is also used extensively in cooking, many families buying it by the gallon. The price ranges from 10 to 20 cents a gallon, 13 cents being about the average. In a number of places it is claimed that nearly as much buttermilk is consumed as whole milk, but exact figures as to the consumption of buttermilk can not be obtained.

Many buttermilk dealers have small dairies of 2 to 6 cows and go to market at irregular intervals with varying amounts of butter and buttermilk, and some cities do not require permits for the sale of buttermilk, hence there is much difficulty in determining the amount consumed.

Buttermilk dairying is popular with some producers, who claim that the income from the buttermilk and butter is almost as much as from whole sweet milk, without the necessity of daily delivery, the annoyance of inspection, and the expense of keeping the dairy up to the standard of cleanliness required for a sweet-milk dairy. But health officers are giving increased thought to buttermilk dairies,



FIG. 10.—A good type of southern barn.

and doubtless in the near future a more careful buttermilk inspection will be demanded. Complaints of ptomaine poisoning alleged to have been due to buttermilk have come from Nashville, Tenn., and elsewhere.

OPPORTUNITIES FOR IMPROVEMENT.

The southern market-milk situation is capable of much improvement. The dairymen can reduce the cost of production very materially by keeping cows better adapted for market-milk production, by studying economy of labor, and by using more cheap home-grown

feeds suitable for milk production. Again the situation is capable of great development by an increased consumption. The per capita milk consumption in the South is below the average for the country. The per capita daily consumption of milk in the United States is estimated at about two-thirds of a pint; in Boston, Mass., it is eight-tenths of a pint; and as high as 1 pint is reported from some cities. On the other hand, in most southern cities the daily consumption is less than half a pint, and as low as one-third of a pint is named in some places. This showing may be somewhat misleading because of the large amount of buttermilk used, which doubtless takes the place of some sweet milk; but even if liberal allowance is made for this, the fact remains that the South consumes less than the average amount of milk. Moreover, the use of cream, of which large amounts are consumed in the North, is almost unknown in the South.

Several reasons for this low per capita consumption of milk and cream can be given: Indifference as to the food value of milk, an inherited habit of using milk in small quantities, an insufficient supply, suspicion of the purity of the product, and the large negro population. The latter consumes little or no milk, but materially increases the divisor to be used in ascertaining the per capita consumption. The last-named factor is, of course, purely sectional; but as regards the others, experience in different northern cities and towns has shown that an abundant supply of milk of unquestioned quality tends to increase the amount that is used; also that a campaign of education among producers helps consumption. Hence we may assume that when the milk supply of southern cities is improved by means of better sanitary inspection, and when the public realizes that an ample supply of clean, safe milk can be obtained, increasing amounts will be consumed.

Here is another opportunity for improving the condition of the southern dairyman. As the public is educated to realize the difference in the way good milk is produced as compared with the inferior article, there will be a willingness not only to consume more of that which is produced in the proper manner, but also to pay a higher price for it, as for a high-grade article. Already in Memphis and Nashville, Tenn., Asheville, N. C., and other places some dairies easily get 1 to 4 cents a quart more than others merely because the public has confidence that the product is pure and clean.

WHY DAIRYING IS UNDEVELOPED IN THE SOUTH.

By B. H. RAWL,

*Assistant Dairyman in charge of Dairy Farming Investigations, Dairy Division,
Bureau of Animal Industry.*

CONSUMPTION AND PRODUCTION.

The extent of the market for the various kinds of dairy products in the South has been shown in Table 4 (page 14), where data are given from 50 cities distributed throughout 13 States. The amounts of dairy products mentioned in Table 6, which are handled in these 50 cities, are far greater than the total amounts of those products produced in the 13 States in which the cities are located. The extent of production in these States and the difference between this home supply and the market demand are shown in the table below. This table is a partial summary of Table 4, with some additional matter:

TABLE 6.—*Products handled in 50 southern cities, and estimated financial gain if produced at home.*

Product.	Quantity imported into 50 southern cities.	Amount produced in 13 Southern States. ^a	Average retail price.	Value of imported product.	Cows needed to supply deficiency. ^b	Cost of keeping cows at \$45 a year.	Estimated profits that could be saved to the South. ^c
Creamery butter.....	<i>Pounds.</i> 23,494,941	<i>Pounds.</i> 890,768	<i>Cents.</i> 33 $\frac{1}{2}$	<i>Dollars.</i> 7,850,705	<i>Number.</i> 69,747	<i>Dollars.</i> 3,138,615	<i>Dollars.</i> 4,712,090
Renovated butter ^d	7,162,701	33,260	26	1,862,302	21,317	959,265	903,037
Cheese.....	41,582,545	782,000	20	8,316,509	69,304	3,118,680	5,197,829
Condensed milk ^e	42,560,688	.....	10	4,256,069	14,187	638,415	3,617,654
Oleomargarin ^f	3,361,483	522,900	20	672,297	10,004	450,180	222,117
Total .....	.....	.....	.....	22,957,882	184,559	8,305,155	14,652,727

^a Census of 1905.^b Cows giving 6,000 pounds of milk or 336 pounds of butter.^c Cost of manufacture not deducted.^d Report of 39 cities.^e Report of 49 cities.^f Report of 40 cities; amount consumed in the 13 States, 6,766,221 pounds.

It will be noticed from the above table—

1. That the value of the dairy products shipped into these 50 cities (not including similar products that are shipped into other cities of those States) is \$22,957,882, or an average of \$459,157 per city.
2. That 184,559 cows, each giving 6,000 pounds of milk, or 336 pounds of butter, would be required to produce these products.
3. That after allowing \$45 per cow for the cost of feed there would still remain, on the basis of retail prices given in Table 5, a profit of \$14,652,727, or an average of \$293,054 per city (cost of delivery not considered).
4. That 12,304 dairy farms, or an average of 246 farms per city, with 15 cows of the kind above named on each farm, would be required to supply these products.

5. That after allowing for the cost of the feed at the rate above given there would remain a profit of \$1,191 per farm (the by-products of the dairy—calves, manure, skim milk, etc.—paying for the labor).

6. That each of these farms would require two men to operate it, hence giving profitable employment to 24,608 men, or an average of 492 men per city.

7. That since these dairies would greatly facilitate the growth of all kinds of crops, their development would tend to increase rather than decrease other agricultural products in that section.

There are hundreds of farmers throughout the South, each of whom could add a 15-cow dairy to his farm, and could besides in a short while easily produce more of other crops than he is producing at present.

WHY SOUTHERN DAIRYING IS UNPROFITABLE.

Dairying is undeveloped in the Southern States largely because the farmers of that section do not understand how to make it profitable. They realize the necessity of more fertilizer for their farms, and they are buying large quantities of it at high prices. They realize, too, that barnyard manure is superior to commercial fertilizer, but they do not understand how to keep the cattle to make the manure without sustaining a loss on the cattle.

This is due principally to three things: (1) The cattle now kept are, as a rule, inferior and could not be kept profitably under any circumstances; (2) many dairymen buy practically all their feed instead of growing it, especially those who live near the city and can get a good price for their products; and (3) the dairyman who lives some distance from the city and sells butter as a rule makes an inferior product. A very large per cent of the dairies in the Southern States are suffering from at least two of these difficulties and in many cases from all three.

Low Average Production Per Cow.

In the 13 States named in Table 4 the average cow, according to the census of 1900, produces annually only 3,036 pounds of milk, which it is estimated will average 4.8 per cent of butterfat, and will therefore make 145.7 pounds of butterfat, or about 170 pounds of butter. In the following two tables the returns from this average cow are compared with the returns from a good cow. The standard adopted for the good cow—6,000 pounds of milk, making 288 pounds of butterfat—is reasonable, since in some herds in the South each cow in the herd has exceeded it in her average.

The tables show the average amount received under each of the three methods of marketing commonly used in that section. The prices given are averaged from Table 5.

TABLE 7.—*Estimated net returns from an average southern cow in one year under three methods of marketing.*

Method of marketing.	Milk produced.	Average price.	Amount received.	Cost of feed.	Net returns.
	<i>Gallons.</i>				
1. Producer sells whole milk retail . . .	353	8.6 cents per quart . . .	\$121.43	\$40	^a \$46.13
2. Producer sells whole milk to dealer . . .	353	17 cents per gallon . . .	60.01	40	20.01
3. Producer sells dairy butter— ^b 145.7 pounds butterfat making 170 pounds butter.		25.8 cents per pound . . .	43.86		
Leaving 2,890 pounds skim milk.		20 cents per 100 lbs. ^c	5.78		
Total receipts from butter making.			49.64	40	9.64

^a After deducting \$35.30 for cost of delivery at 10 cents a gallon.^b Using 4.8 per cent as fat test.^c Estimated value for feeding purposes.TABLE 8.—*Estimated net returns from a good cow in one year under same three methods of marketing given in Table 7.*

Method of marketing.	Milk produced.	Average price.	Amount received.	Cost of feed.	Net returns.
	<i>Gallons.</i>				
1. Producer sells whole milk retail . . .	^a 698	8.6 cents per quart . . .	\$240.11	\$45	^b \$125.31
2. Producer sells whole milk to dealer . . .	698	17 cents per gallon . . .	118.66	45	73.66
3. Producer sells dairy butter— ^c 288 pounds butterfat making 336 pounds butter.		25.8 cents per pound . . .	86.69		
Leaving 5,712 pounds skim milk.		20 cents per 100 lbs. ^d	11.42		
Total receipts from butter making.			98.11	45	53.11

^a Six thousand pounds, or 698 gallons.^b After deducting \$69.80 for cost of delivery at 10 cents per gallon.^c Using 4.8 per cent as fat test.^d Estimated value for feeding purposes.

Dairying is to a large extent restricted to an area around the cities. Table 7, which represents actual conditions, will show the cause of this fact. The average cow in a dairy herd located so that the milk can be delivered direct to the consumer earns \$46.13 a year, after paying for feed and delivery; if this cow's milk is made into butter she earns \$9.64 after paying for feed (no allowance being made for farm labor in either case). From these facts the average dairyman would decide that supplying retail milk is the more profitable. As a matter of fact there is little profit in either one. The man who is retailing milk often has no farm, therefore has no use for manure and does not take care of it, and being located near the city labor is more expensive. The man who sells butter perhaps has a farm, and therefore his feed may cost less than \$40 per cow; then, too, if he clears nothing more than the manure, this may enable him to make his farm very profitable for other things; such cases are not uncommon.

In cases where milk is sold wholesale (2, Table 7) it would appear that some advantages exist. In such cases the dairymen usually own farms, and a few of them have made money. Still there are disadvantages to be contended with. The profit is greater than in butter making (3, Table 7), but no allowance is made for expense of

shipping, there is no skim milk, and on the whole perhaps no more can be said for this class than for the other two. They are all to a large extent failures.

Different Results with High-Class Dairy Cows.

Where, then, are the successful dairies found? They are in the classes represented in Table 8. In this table each of the classes has an excellent showing for a profit, if reasonably good business methods are used.

In comparing Table 8 with Table 7 it will be seen that in the former \$45 is allowed for the cost of feed, as against \$40 in Table 7. If the methods used in both cases were the same the difference should perhaps be greater; in other words, \$40 would probably be more than is necessary to feed the average cow. But it is safe to assume that such is not the case, because the man who does not know enough to keep cows that are above the average, as a rule, does not know enough to feed them most economically.

In continuing this comparison it will be noted: (1) That after allowing for feed and delivery there remains from the retailing of the milk \$125.31 in the case of the good cow, as against \$46.13 for the average cow; (2) that after allowing for feed there remains from the wholesaling of the milk \$73.66 in the case of the good cow, as against \$20.01 for the average cow; and (3) that after allowing for feed and adding the value of the skim milk there remains from the sale of the butter \$53.11 in favor of the good cow, as against \$9.64 for the average cow.

The question that naturally arises from a comparison of Tables 7 and 8 is, Why will any man keep such cattle as are represented in Table 7 when he can make so much more profit with better cattle, as shown in Table 8? There can be no answer other than that it is because of a lack of knowledge. According to the census of 1900 there were 4,097,961 cows in the States named in Table 4. These cows were annually producing 1,444,291,536 gallons of milk, or 596,203,546 pounds of butterfat. If these cattle were of the class shown in Table 8, they would produce 2,859,042,558 gallons of milk, or 1,180,212,768 pounds of butterfat; an increase of 1,414,751,022 gallons of milk, or 584,009,222 pounds of butterfat. Valuing this milk at the average wholesale price given in Table 5, this increase would be worth \$240,507,674; or valuing the butterfat in this milk according to the wholesale rate in the table it would be worth \$175,785,776.

In other words, the dairymen are annually losing not less than \$175,786,776 because they are keeping cows that produce an average of 353 gallons of milk per annum instead of cows that will produce 698 gallons, or 6,000 pounds, per annum. This is too important an

item for the dairyman to overlook; and it is certainly one of the most important causes of the present undeveloped condition of the dairy industry in the Southern States.

HOW TO GET GOOD COWS.

In considering this question, the source whence dairy cattle are obtained is of paramount consideration. It is true that the southern dairies are to a large extent in the vicinities of the cities, therefore, as has previously been shown, it is more profitable for them to sell whole milk. Skim milk as well as the facilities of the farm are lacking, consequently the raising of calves becomes a difficult and expensive operation. As a result the majority of such dairymen rely entirely on the market for their supply of cattle. In the interior country districts there is usually very little dairying, hence the supply of dairy cattle in those districts is very limited. The stock yard therefore becomes the only source of supply of cattle for a very large proportion of the dairies. Cows that are in milk are purchased, and when they go dry they are again sent to the stock yard. This practice is one of the essential causes of the low average milk production of southern cattle.

But in addition to this practice, those who do raise dairy cattle usually breed their cows to inferior, scrub, or grade bulls, and ignore the performances of the individual cows. These customs will surely prevent any marked improvement of the herd. Three things are recognized as essential by all successful breeders of dairy cattle: (1) Systematic records should be kept of all cows so as to determine which are profitable; (2) a purebred bull, well selected, should be used; and (3) the heifer calves from the best cows only should be retained in the herd. Some of these heifers will prove to be inferior individuals, and should be disposed of; but if the system is consistently carried out it will produce gradual improvement in the herd, regardless of what grade of cattle was used to begin with.

But even this does not solve the problem for the man who has neither farm facilities nor skim milk with which to raise calves. What, therefore, can he do? First, under average conditions, he should either buy a farm or get out of the dairy business. This is particularly true of the Southern States, where so much feed can be produced at a comparatively small cost, and where good pastures can be maintained for a great part of the year. But when the farm has been procured, how will the skim milk be obtained which is so essential in raising calves? This is an important consideration, and can often be provided for in the following manner:

There is a great demand for sweet cream throughout the South, which is often either supplied from the North or remains unsupplied. As it commands a very good price, very often such cream will bring as much as the whole milk from which it was taken. Therefore a whole-milk business can often be converted into a sweet-cream business without reducing the income from sales, and thus the skim milk can be retained at little or no cost. Sometimes it may be best to separate the cream from only enough of the milk to provide a sufficient supply of skim milk for the calves, and then sell this cream to the same customers who buy the whole milk. Even if a small loss in the sales is at first sustained by this system, it must be remembered that good cows are absolutely essential to a profitable dairy and that the increased production which will result from this system will soon offset any loss that was sustained at first in putting it into practice.

FEEDING.

In order that cattle may produce the most milk and do it most economically, they must have suitable feed, not all of which can be obtained by buying on the market. Green feed is very essential, and when it is not available direct from the field it should be supplied in the form of silage. It is impracticable to go into a discussion of feed in this paper, but too much emphasis can not be given to the matter of preparing the right kind of feed. In many cases the cows are fed on nothing but cotton-seed meal and hulls. This is not only an expensive feed, but it is entirely insufficient to give the best results. When used in combination with silage and good hay, cotton-seed meal particularly can be used to good advantage. Another very bad practice in connection with feeding is that the cattle are often not fed enough. Many a good cow is producing far less than her maximum because of an insufficient amount of feed.

As mentioned elsewhere, the inclination of the dairyman to rely entirely upon the market for his supply of feed is a very great drawback to the dairy industry of the South, and is a bad practice in two ways: (1) It is impossible to supply entirely from the market the kind of feed that is best for the cows, and (2) even if a suitable feed could be obtained from the market, it would be more expensive than if grown on the farm. All rough feed, at any rate, and in some cases a part of the grain, can be grown to great advantage. With the great variety of forage crops, particularly legumes, that are available under southern conditions, the production of feed is neither difficult nor expensive, and yet in this section the dairymen are producing less feed than in almost any other part of the United States. The southern dairyman can never fully succeed until he produces more of his feed.

Pastures can be made that will furnish good grazing for the greater part of the year. There are two reasons why pastures should be used liberally, namely, the long pasture season, and the cheap lands; yet comparatively few southern dairymen have proper pastures. The waste lands of the farms that are covered with ditches and pine saplings are often fenced, but no further improvement is made; such pastures are little better than useless.

INFERIOR BUTTER.

There is in the South a large amount of butter sold to the renovated-butter factories as packing stock. This as a rule does not come from the dairies, but much of the dairy output also would be thus sold if the butter market were as discriminating as it is in some sections. The above-mentioned packing stock is what is commonly called "country butter," and comes from farms where one or two cows are kept for family use, the surplus butter being sold to a near-by grocery store. The stores are compelled to purchase such butter to retain the trade of those who sell the butter. Often the stores can retail this butter at once to other customers, but what can not be disposed of in this way is packed in barrels and when a sufficient amount has accumulated it is shipped to some renovating factory. Thus it is that this country butter often sells for from 7 to 15 cents a pound when good butter is retailing at an average price of $33\frac{1}{2}$ cents per pound (1907 prices). This discrimination on the part of the consumer is not against the producer, but instead is against an inferior article which the consumer will not accept, and which must, therefore, be sold as packing stock. This may seem like a very small item to the individual farmer who is producing such butter, but the practice is costing the farmers of the South in the aggregate an immense sum of money annually. The remedy for this practice is for those who are producing such butter to study the subject of butter making until a good article can be made. It is often true also that those who are producing packing stock are of the opinion that this butter is as good as can be made and that there is some other cause of such discrimination against their product. Every farmer who is conducting his work in a business-like manner must look after such details.

In Tables 7 and 8 butter production is shown to be the least profitable of the three kinds of dairying mentioned. But since this kind of dairying can be done anywhere, irrespective of the location of the market, it is by far the most important branch of the dairying of the South. When properly conducted it can be made very profitable,

and there are a number of examples in various places that prove this. On these farms a dairy house suitably equipped for making butter on a small scale is provided at little cost, and when the proper methods are used excellent results are obtained. A small number of such plants are producing butter that always sells for the highest market price. When results are not satisfactory it is usually found that bad methods are practiced. It is hoped that the better kind of dairying will grow more in favor with the southern farmers.

HIGHER PRICES FOR BETTER MILK.

In the preceding article it is shown that the sanitary conditions surrounding the milk supply of many cities in the South are bad; hence dangerous milk is the result. There is now a great movement in progress throughout the whole country to improve the milk supply. To accomplish this it is often considered necessary that a higher price be paid for a better quality of milk, because the cost of producing it is greater. While this is generally the case, it is notably true that in some cities where prices are highest the quality of the milk is poorest.

It is also true that very unprofitable dairies often get the same price for their product as very profitable ones that are operating under exactly the same natural conditions. While quality in milk must be appreciated by the consumer and paid for, still there is usually something needed in addition to higher prices.

SUMMARY.

Some of the improvements which the situation demands have been suggested in the foregoing pages, and these are briefly reviewed in the following summary:

1. There is no branch of agriculture that is more needed in the South than dairying. It is not only a profitable industry in itself, but it may be made the means of increasing the productiveness of the soil and promoting a better type of agriculture.
2. It is found that southern dairymen, as a rule, are not using the most economic methods in the following particulars: (a) The production of the average cow is only about half what it should be. (b) Too many of the dairies are in the cities, when they should be on the farms; hence too high-priced feed and bad methods of feeding. (c) Milk and butter of poor quality are produced, which do not bring the highest prices.

3. It is strikingly true that in most cases where an inferior dairy herd has been in existence for some years it will be found that expensive methods are being practiced and an inferior grade of output is being produced.

4. Southern dairying needs improvement all along the line. The cost of production is unreasonably high, the sanitary conditions are often bad, and the price of first-class products is in some cases too low.

5. The three main points that every southern dairyman should bear in mind, and which can not be too strongly emphasized, are—

Better cows.

More home-grown feed.

A better product.

FARMERS' BULLETINS.

The following is a list, by number, of the Farmers' Bulletins available for distribution. The bulletins entitled "Experiment Station Work" give in brief the results of experiments performed by the State experiment stations. Titles of other bulletins are self-explanatory. Bulletins in this list will be sent free to any address in the United States on application to a Senator, Representative, or Delegate in Congress, or to the Secretary of Agriculture, Washington, D. C. Numbers omitted have been discontinued, being superseded by later bulletins.

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- 54. Some Common Birds. Pp. 48.
- 55. The Dairy Herd. Pp. 30.
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- 59. Bee Keeping. Pp. 48.
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- 73. Experiment Station Work—IV. Pp. 32.
- 74. Milk as Food. Pp. 39.
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